

REMARKS

Reconsideration of this application, as presently amended, is respectfully requested. Claims 1, 3-6 and 8-11 are pending in the present application. Claims 1, 3-6 and 8-11 were rejected.

Claim Rejections – 35 U.S.C. §103

Claims 1, 3-6 and 8-11 were rejected under 35 U.S.C. §103(a) as being unpatentable over **Uchida et al.** (USP 4,664,601) in view of **Sakagami et al.** (USP 5,961,291, previously cited). For the reasons set forth in detail below, this rejection is respectfully traversed.

Initially, it is noted that independent claims 1, 6 and 11 have been amended to clarify aspects of the present invention. In particular, claims 1, 6 and 11 have been amended to recite a motor for rotating the pump rotors. It is submitted that the presently claimed “motor” is inherently an element of the vacuum pump previously claimed, and therefore it is submitted that adding this feature to the present claims does not raise new issues requiring further consideration and/or search. Accordingly, the present claim amendments should be entered and considered at this time.

In the current rejection, the Examiner relies on the **Uchida et al.** reference to teach the claimed vacuum pump comprising “a pair of pump rotors rotatably disposed in a casing, said pump rotors being rotatable synchronously in opposite directions.” The Examiner relies on **Sakagami et al.** to teach the claimed “pump rotor controller” and the control operations performed by the pump rotor controller.

Sakagami et al. disclose a turbo molecular pump using magnetic bearings for rotatably support a shaft. As the Examiner states, **Sakagami et al.** discloses in column 9, lines 37-39 that “the pump rotor may be turned forwardly and reversely a predetermined number of times by a small angle”. However, this movement of the pump rotor differs from the rotation of the pump rotors in the presently claimed invention because the movement of the pump rotor of **Sakagami et al.** is caused by magnetic bearings. See, e.g., claims 6 and 13 of **Sakagami et al.** Claim 6 recites that the magnetic bearings are used to displace the rotary shaft a predetermined number of times. Claim 13, which depends from claim 6, recites the further limitation that movement of the rotary shaft is forward and reverse axial rotations.

Neither **Sakagami et al.** nor **Uchida et al.** disclose or suggest “*a motor configured to rotate said pump rotors; and a pump-rotor controller for controlling rotation of said pump rotors through said motor* in accordance with a predetermined pattern when said vacuum pump is started, the predetermined pattern including a combination of at least two of rotation of said pump rotors in a forward direction, rotation of said pump rotors in a reverse direction, and stop of the rotation,” as presently recited in claim 1 (and recited similarly in claims 6 and 11).

To help illustrate the differences between the claimed invention and the **Sakagami et al.** reference, please refer to attached FIGS. I-IV. In particular, FIG. I shows a typical magnetic bearing unit of five-axis-control-type. This type of magnetic bearing unit includes two pairs of radial magnetic bearings for supporting a radial load of the shaft and one pair of axial magnetic bearings for supporting an axial load of the shaft. These magnetic bearings are controlled so as to support the shaft with a small gap between the bearings and the shaft.

The five-axis-control-type magnetic bearing unit can only displace or move the shaft in the radial direction or the axial direction, and cannot rotate the shaft about its own axis. Thus, in addition to the magnetic bearings, a motor is provided for rotating the shaft about its own axis to evacuate a gas, as shown in FIG. II.

FIG. III shows the manner of movement of the shaft in **Sakagami et al.** As can be seen from FIG. III, the shaft orbits around a center of a stator of the magnetic bearing unit. However, the shaft itself does not rotate about its own axis. In other words, the shaft just performs a parallel movement along an inner circumferential surface of the stator.

On the other hand, FIG. IV shows the manner of the rotation of the shaft in accordance with an aspect of the present invention. As can be seen from FIG. IV, the shaft rotates about its own axis by the motor drive.

Accordingly, the parallel movement caused by the magnetic bearings is completely different from the rotation caused by the motor. Moreover, the parallel movement of the shaft requires the magnetic bearings and a magnetic bearing controller, in addition to a motor and a motor controller for rotating the shaft. See the drawing provided along with the Abstract on the cover page of **Sakagami et al.** The present invention does not require such magnet bearings and a magnet bearing controller. Therefore, the structure can be compact and a lowered cost can be achieved.

A rejection under §103 requires that the combination of references must disclose, suggest or render obvious all elements recited in the claims. As discussed above, it is submitted that the combination of **Uchida et al.** and **Sakagami et al.** does not disclose, suggest or render obvious

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all elements recited in independent claims 1, 6 and 11, and claims dependent therefrom. Accordingly, reconsideration and withdrawal of the rejection under §103 are respectfully requested.

CONCLUSION

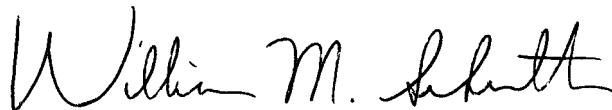
In view of the foregoing, it is submitted that all pending claims are in condition for allowance. A prompt and favorable reconsideration of the rejection and an indication of allowability of all pending claims are earnestly solicited.

If the Examiner believes that there are issues remaining to be resolved in this application, the Examiner is invited to contact the undersigned attorney at the telephone number indicated below to arrange for an interview to expedite and complete prosecution of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP



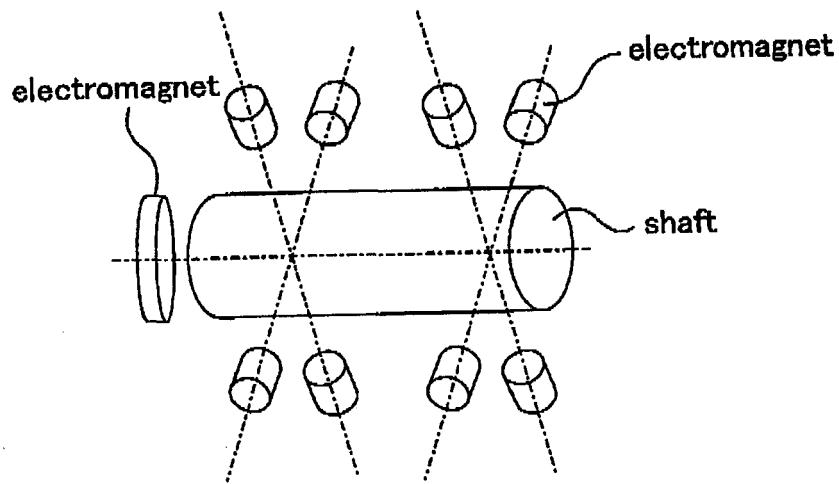
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Attachments: Explanatory FIGS. I-IV

Attachments

Explanatory FIGS. I-IV

FIG. I



Five-axis-control-type magnetic bearing

FIG. II

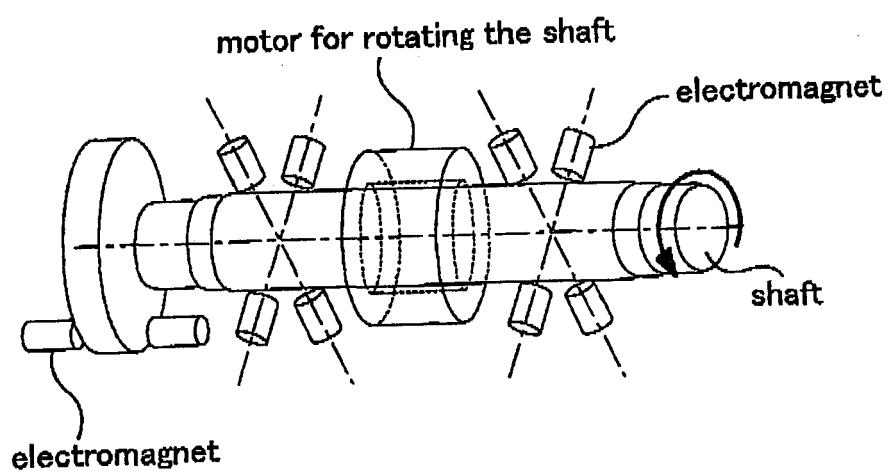


FIG. III

Sakagami reference

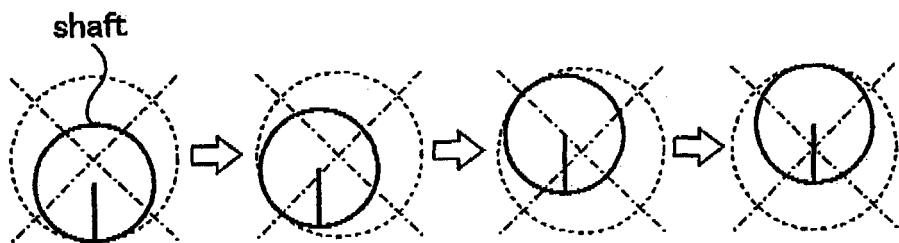


FIG. IV

Present Invention

